

BASF Coatings AG

Integrated painting process for automobile and commercial vehicle bodies or cabins and their replacement parts and add-on parts comprising plastic parts

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Patent claims

1. An integrated process for painting automobile and commercial vehicle bodies and cabins and their replacement parts and add-on parts which comprise plastic parts, wherein

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1) the metal parts of the body or cabin and/or their replacement parts or add-on parts are coated with an electrocoat material and the resulting electrocoat film is cured thermally to give the corrosion-inhibiting electrocoat;

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2) the electrocoated metal parts of the body or cabin and/or of their replacement parts or add-on parts are integrated with the plastic parts of the body or cabin, said plastic parts having

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2.1) no priming on their surface,

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2.2) on their surface, priming consisting of an electrically conductive aqueous primer coating which is cured thermally at temperatures $\leq 100^{\circ}\text{C}$, or

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2.3) on their surface, a partially dried but not fully cured electrically conductive aqueous primer film;

10 3) the integrated metal-plastic body or cabin are coated with an aqueous primer, where

15 3.1) the integrated metal-plastic body or cabin and its replacement parts and add-on parts whose plastic parts have no primer (variant 2.1) are uniformly coated with an electrically conductive aqueous primer and the resulting aqueous primer film is cured at temperatures $\leq 100^{\circ}\text{C}$ to give a two-coat primer system comprising electrocoat and electrically conductive aqueous primer coat on the metal parts and a single-coat primer system comprising electrically
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25 conductive aqueous primer coat on the plastic parts;

3.2) the integrated metal-plastic body or cabin and its replacement parts and add-on parts whose plastic parts have priming consisting of an aqueous primer coating (variant 2.2) are uniformly coated with a pale aqueous primer and the resulting pale aqueous primer film is cured at temperatures $\leq 100^{\circ}\text{C}$ to give a two-coat primer system comprising electrically conductive aqueous primer coat and pale aqueous primer coat on the plastic parts and a two-coat primer system comprising electrocoat and pale aqueous primer coat on the metal parts;

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or

3.3) the integrated metal-plastic body or cabin and its replacement parts and add-on parts whose plastic parts have a partially dried electrically conductive aqueous primer film (variant 2.3) are uniformly coated, wet-on-wet in terms of the plastic parts, with a pale aqueous primer, after which the electrically conductive aqueous primer film and the pale aqueous primer film are jointly cured at temperatures $\leq 100^{\circ}\text{C}$ to give a

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two-coat primer system comprising electrically conductive aqueous primer coat and pale aqueous primer coat on the plastic parts and a two-coat primer system comprising electrocoat and pale aqueous primer coat on the metal parts;

4) an aqueous color and/or effect basecoat material is applied uniformly to the primer systems and the resulting aqueous basecoat film is partially dried without curing, after which

5) at least one two-component clearcoat material is applied wet-on-wet to the partially dried aqueous basecoat film to give at least one clearcoat film; and

6) the partially dried aqueous basecoat film and the at least one clearcoat film are jointly cured at temperatures $\leq 100^{\circ}\text{C}$, thermally or both thermally and with actinic radiation, to give the integrated multicoat color and/or effect paint system.

2. The process as claimed in claim 1, characterized in that in step (2) of the process the electrocoated metal parts of the body or of the cabin and/or the replacement parts or add-on parts

are placed on an assembly stage (skid) on which the plastic parts of the body or cabin have already been precisely positioned.

5 3. The process as claimed in claim 1 or 2, characterized in that in step (3.1) of the process the procedure adopted is to

10 (3.1.1) apply a pale aqueous primer uniformly to the cured electrically conductive aqueous primer coat and to cure the resulting pale aqueous primer coat thermally at temperatures $\leq 100^{\circ}\text{C}$

15 or

20 (3.1.2) partially dry the electrically conductive aqueous primer film following its application, without full curing, to apply a pale aqueous primer wet-on-wet to the partially dried electrically conductive aqueous primer film, and then to cure the electrically conductive aqueous primer film and the resulting
25 pale aqueous primer film jointly at temperatures $\leq 100^{\circ}\text{C}$,

so as to result, in accordance with both variants,
in a three-coat primer system comprising
electrocoat, electrically conductive aqueous
primer coat and pale aqueous primer coat on the
5 metal parts and a two-coat primer system
comprising electrically conductive aqueous primer
coat and pale aqueous primer coat on the plastic
parts.

10 4. The process as claimed in one of claims 1 to 3,
characterized in that a lead-free cathodically
deposable electrocoat material based on at least
one epoxy-amine adduct is used.

15 5. The process as claimed in one of claims 1 to 4,
characterized in that the electrically conductive
aqueous primer comprises a component I comprising
at least one aqueous polyurethane dispersion and
at least one electrically conductive pigment, and
20 at least one component II comprising at least one
polyisocyanate.

6. The process as claimed in claim 5, characterized
in that carbon black is used as electrically
25 conductive pigment.

7. The process as claimed in one of claims 1 to 6,
characterized in that the pale aqueous primer

comprises a component I comprising at least one hydroxyl-containing binder in dispersion or solution in water and at least one pale pigment, and a component II comprising at least one polyisocyanate.

8. The process as claimed in claim 7, characterized in that at least one polyester, polyacrylate, polyurethane, acrylated polyester and/or acrylated polyurethane, especially a polyurethane, is used as hydroxyl-containing binders.

9. The process as claimed in one of claims 1 to 8, characterized in that the aqueous basecoat material comprises at least one hydroxyl-containing binder in dispersion or solution in water and at least one color and/or effect pigment.

10. The process as claimed in claim 9, characterized in that the aqueous basecoat material as hydroxyl-containing binders at least one polyurethane and/or at least one acrylated polyurethane is used.

11. The process as claimed in claim 9 or 10, characterized in that the aqueous basecoat material further comprises at least one hydroxyl-

containing polyacrylate, one hydroxyl-containing polyester and/or one hydroxyl-containing acrylated polyester as additional binder(s).

5 12. The process as claimed in one of claims 1 to 11, characterized in that the aqueous basecoat material comprises at least one crosslinking agent.

10 13. The process as claimed in one of claims 1 to 12, characterized in that the two-component clearcoat material comprises a component I having at least one hydroxyl-containing binder and a component II having at least one polyisocyanate.

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14. The process as claimed in one of claims 1 to 13, characterized in that the two-component clearcoat material is curable thermally or both thermally and with actinic radiation (dual cure).

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15. The process as claimed in one of claims 1 to 14, characterized in that the cured two-component clearcoat material is overcoated with a highly scratch-resistant clearcoat.

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16. An integrated multicoat color and/or effect paint system for integrated automobile and commercial vehicle bodies or cabins and their replacement

parts and add-on parts which comprise plastic parts, comprising the following coats lying atop one another in the stated sequence:

5 1) on the metal parts, a cathodically or
 anodically, especially cathodically, deposited
 and thermally cured electrocoat and also an
 electrically conductive primer coat and/or a
 pale aqueous primer coat as the primer system,
10 and

 2) on the plastic parts, an electrically
 conductive aqueous primer coat or an
 electrically conductive aqueous primer coat and
15 a pale aqueous primer coat as the primer
 system,

 with the proviso that the integrated automobile
 and commercial vehicle bodies or cabins and
20 their replacement parts and add-on parts are
 uniformly covered over their entire surface by
 at least one aqueous primer coat;

 and
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 3) on the primer system of the metal parts and of
 the plastic parts, a color and/or effect
 basecoat, and

4) on the basecoat, at least one clearcoat.

17. The integrated multicoat color and/or effect paint
5 system as claimed in claim 16, characterized in
that it has been provided with a highly scratch-
resistant clearcoat (6).
18. Automobile and commercial vehicle bodies or cabins
10 and their replacement parts and add-on parts which
comprise plastic parts, comprising at least one
multicoat color and/or effect paint system
producible as claimed in one of claims 1 to 15
and/or at least one multicoat color and/or effect
15 paint system as claimed in claim 16 or 17.